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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/783,550	02/20/2004	Jenn-Wen Huang	DEE-PT140	7463
3624	7590	07/21/2006	EXAMINER	
VOLPE AND KOENIG, P.C. UNITED PLAZA, SUITE 1600 30 SOUTH 17TH STREET PHILADELPHIA, PA 19103			KINNEY, ANNA L	
			ART UNIT	PAPER NUMBER
			1731	

DATE MAILED: 07/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/783,550

Applicant(s)

HUANG ET AL.

Examiner

Anna Kinney

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4, 6, 7, 9-16, 18 and 19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6, 7, 9-16, 18 and 19 is/are rejected.
- 7) ☒ Claim(s) 6, 9 and 18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>2/2/06</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments filed May 2, 2006 have been fully considered but they are not persuasive.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., a *non-woody* fiber plant; Remarks, pg. 8-9; and better decomposition properties; Remarks, pg. 12) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

As discussed in the rejection to claim 1, below, Schulein discloses microorganisms isolated from fiber plants. The Examiner acknowledges that Schulein does not disclose expressly that the claimed Bacilli in particular are derived from fiber plants, and has modified the rejection accordingly, in view of Sweeney and Jeffreys (U.S. 2,766,176).

In response to applicant's argument that Akhtar and Schulein are nonanalogous art (Remarks, pg. 9), it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, both references are from a similar field of endeavor, that of treating lignocellulosic material with enzymes to produce a paper product (i.e.,

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biopulping), as provided in the previous Office Action, pg. 6, last ¶. Akhtar discloses this in the Abstract, lines 1-2 and col. 2, lines 30-32. Schulein discloses this, for instance, in the Abstract, lines 1 and 31-35.

In response to applicant's argument that Schulein is nonanalogous art with respect to the present invention (Remarks, pg. 9-10), the instant specification provides for the application of enzymes for treating lignocellulosic materials in the production of a paper product (pg. 3, ¶ 0004), thereby establishing the analogous nature of Schulein, as discussed above, with the instant invention.

In response to applicant's argument that there is no suggestion to combine the references (Remarks, pg. 9), the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the suggestion was provided in the previous Office Action, pg. 7, ¶ 2.

In response to applicant's arguments that Akhtar uses a white-rot fungus rather than one of the bacilli claimed (Remarks, pg. 10), Akhtar was not applied to show the specific microorganism. Schulein was applied to show *B. lichenformis*, *B. subtilis*, and *B. amyloliquefaciens*. Jeffreys is applied to show the fiber plant culture from which the microorganisms are isolated.

In response to applicant's arguments that the invention provides advantages over

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the prior art (pg. 10-12), attorney arguments cannot take the place of evidence (see MPEP 716.01(c) II.)

### ***Terminal Disclaimer***

The terminal disclaimer filed on May 2, 2006 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of Application 10/783,912 has been reviewed and is accepted. The terminal disclaimer has been recorded.

The terminal disclaimer, however, makes no mention of Application 10/785,884. Therefore, the Examiner has maintained the Double Patenting rejection in which Application '884 was applied.

### ***Specification***

The disclosure is objected to because of the following informalities: on page 3, ¶ 0005, line 2, applicant added the word "and" but did not remove "and" from the end of the word "chrysosporium". Also, on pg. 2, line 1, the Examiner presumes that the word "semicellulose" should be "hemicellulose".

Appropriate correction is required.

### ***Claim Objections***

Claims 9 and 6 are objected to because of the following informalities: in claim 9, the temperature range recited is 20 to 50 0C, rather than the 20 to 50°C recited in the original claim, and in claim 6, the concentration range is from 0 to 10<sup>8</sup> cfu/ml, rather than the 0 to 10<sup>8</sup> cfu/ml recited in the original claim. Since the applicant has not indicated that these claims are amended, the Examiner considers these to be typographical

errors, and construes the limitations to be unchanged for purposes of examination.

Appropriate correction is required.

Claim 18 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The concentration, time, and temperature ranges of claim 18 are already recited in claim 12.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 12, 14, and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required

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feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claims 1 and 14 recite the broad recitations *Bacillus licheniformis*, *Bacillus subtilis*, and *Bacillus amyloliquefaciens*, and the claim also recites PMBP-m5, PMBP-m6, and PMBP-m7, which the Examiner construes to recite specific strains of the bacilli claimed, and which is the narrower statement of the range/limitation.

Claims 1 and 14 are further indefinite in that PMBP is not defined. The term may be interpreted to mean porcine myelin basic protein, progesterone membrane binding protein, print medium-binding peptide, or one of a number of organic chemicals.

Claims 1 and 14 are further indefinite in that the applicant appears to have intended the source of the bacillus isolate to have been in the form of a Markush group. However, as written, the Examiner cannot determine whether the limitation is meant to recite a selection of a fiber plant OR a livestock excrement compost, or if the limitation is meant to recite a selection of fiber plant from a group of fiber plants, combined with a livestock excrement compost. The Examiner has construed the limitation to mean the former for purposes of examination.

Claims 1 and 14 recite the limitation "a fiber plant" in lines 8 of each claim and line 4 of claim 1, and "a non-woody fiber plant" in line 4 of claim 14. There is insufficient antecedent basis for this limitation in the claim. The Examiner cannot determine whether the two references to "a fiber plant" indicate the same fiber plant or different fiber plants.

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Claim 2 recites the limitation "said fiber plant" in line 1 of the claim. There is insufficient antecedent basis for this limitation in the claim. The Examiner cannot determine whether this limitation refers to one or both of the two recitations in claim 1, and which recitation if only one was intended.

Claims 12 and 18 are indefinite in that the claims recite a temperature range of boiling under a temperature ranged from 120°C to 150°C. Water boils at 100°C at standard pressure, which is a temperature under 120°C and under 150°C. Other solvents such as alcohols boil at lower temperatures, as does water at lower pressures. The Examiner cannot determine whether the applicant intended "under a temperature ranged" to mean within the temperature range of 120°C to 150°C, or any temperature below the range that produces boiling in the pulp solution.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1- 3, 6-7, 9-16, and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akhtar (U.S. Patent 6,402,887) in view of Sweeney (U.S. Patent 1,639,152), Schulein et al (U.S. Patent 6,387,690), and Jeffreys (U.S. 2,766,176).

With respect to claim 1, Akhtar discloses a production method for a paper pulp (col. 1, lines 7-10), comprising steps of: (a) providing a culture solution (col. 6, lines 21-27); (b) adding a fiber plant into said culture solution (col. 6, lines 25-27); (c) adding a



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suspension of a microorganism into said culture solution (col. 6, lines 21-27 and 46-47); (d) fermentatively culturing said culture solution for preparing a pulp solution (col. 6, lines 60-61); (e) boiling (e.g., steaming) said pulp solution (col. 11, lines 37-39); (f) pulping said pulp solution (col. 7, lines 34-43); and (g) screening said pulp solution for isolating a paper pulp from said pulp solution (col. 9, lines 31-37). Since pulp does not dissolve in water and water-based liquor, the most likely pulping medium, the Examiner construes "pulp solution" to mean "pulp suspension". Akhtar discloses that the microorganisms contain desirable enzyme systems to selectively degrade wood (col. 2, lines 30-32).

Although Akhtar does not disclose expressly boiling the pulp solution, Akhtar does disclose steaming the pulp solution as described above. At the time of the invention, it would have been obvious to a person of ordinary skill in the art that the pulp solution would boil in the steps of steaming and cooking the pulp.

Akhtar does not disclose expressly that the microorganism is one of the bacilli of the group claimed.

Sweeney discloses a production method for a paper pulp (Title), wherein a fiber plant is added to a culture solution and a bacterial microorganism (col. 1, lines 19-30).

Schulein discloses treatment of cellulosic material with an enzyme in the production of a paper pulp (col. 42, line 44 - col. 43, line 29), as well as enzymatic hydrolysis of various plant cell-wall derived materials or waste materials (col. 43, lines 52-67), wherein the enzymes are produced using bacterial host cells such as *Bacillus licheniformis*, *Bacillus subtilis* and *Bacillus amyloliquefaciens* (col. 22, lines 37-47).

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Schulein further discloses microorganisms isolated from fiber plants or dung (col. 24, line 20 – col. 28, line 62), but does not disclose that the claimed bacilli are isolated from those sources.

Jeffreys discloses a process for culturing bacteria (Title) including strains of *Bacillus subtilis*, such as *Bacillus licheniformis* (col. 4, lines 63-71), grown in a culture medium composed of vegetative fibrous material (i.e., a fiber plant; col. 2, line 70 – col. 3, line 1).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use a bacterial microorganism, as described by Sweeney, using Bacilli as described by Schulein, isolated from a fiber plant as described by Jeffreys, in the pulp production method of Akhtar, to obtain the invention as specified in claim 1.

The motivation would have been to produce products with a minimum amount of simple and inexpensive apparatus, without chemicals and without the application of heat (Sweeney, col. 2, lines 68-73); improved energy savings (Schulein; col. 42, lines 49-61) and improved fibre properties (Schulein; col. 42, line 62 – col. 43, line 29); and to introduce the necessary food elements preferably in amounts for optimum growth (Jeffreys, col. 3, lines 5-13).

With respect to claim 2, Sweeney discloses that said fiber plant is a non-woody fiber plant (col. 1, lines 19-38).

With respect to claim 3, Akhtar discloses that said fiber plant is pretreated by a steaming treatment under a relatively high temperature (col. 5, line 59 to col. 6, line 14).

With respect to claim 6, Akhtar does not disclose expressly that said microorganism is inoculated at a concentration ranged from 0 to  $10^8$  cfu/ml. However, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to optimize the amount of microorganism used to obtain the desired results. Furthermore, the wide range claimed indicates a lack of criticality. Finally, since Akhtar does not disclose expressly the bacillus microorganisms recited in claim 1, the Examiner construes Akhtar to disclose inoculating the bacillus microorganisms at a concentration of 0 cfu/ml.

With respect to claim 7, Schulein et al discloses that said microorganism is a Gram positive bacterium selected from a group consisting of a *Bacillus licheniformis*, a *Bacillus subtilis* and a *Bacillus amyloliquefaciens* (col. 22, lines 37-47).

With respect to claim 9, Akhtar discloses that the fermentatively culturing process is proceeded at a temperature range of about 22°C to about 32°C, preferably about 27°C (col. 7, lines 14-17), which contains three specific points (22, 27, 32) within the claimed range of from 20 to 50°C.

With respect to claim 10, Akhtar discloses that the fermentatively culturing process is one of a static culture and a shaking culture (col. 6, lines 60-65; col. 8, lines 49-50). The Examiner construes this limitation to mean either a static culture or a shaking culture, rather than a combination thereof.

With respect to claim 11, Akhtar discloses that the fermentatively culturing process is proceeded over about 1 to 4 weeks (col. 7, lines 23-33), which contains one specific point (1 wk. = 7 days) within the claimed range of 0 to 10 days.

With respect to claims 12 and 18, Akhtar discloses step (e) as discussed in the rejection to claim 1, above. Akhtar further discloses that the step was done for 10 minutes (col. 11, lines 37-39). At the time of the invention, it would have been obvious to a person of ordinary skill in the art that steam would have a temperature of at least 100°C, and since the pressure disclosed by Akhtar is slightly above atmospheric (138 kPa, col. 11, lines 37-39), the temperature would be slightly higher.

Sweeney discloses a step of adding CaO (e.g., lime) into said pulp solution and boiling (e.g., cooked in an auto-clave) said pulp solution (col. 2, lines 74-83). Sweeney does not disclose expressly the amount of CaO, so the Examiner construes the amount to be 0% or above, which provides 1 specific point within the claimed range of 0 to 4%.

At the time of the invention, absent a showing of unexpected results, it would have been obvious to a person of ordinary skill in the art to optimize the concentration of CaO, and the time and temperature of the step, to achieve a more complete disintegration of the mass (Sweeney, col. 2, lines 74-83). It has been held that discovering the optimum or workable ranges or an optimum value of a result effective variable involves only routine skill in the art. See MPEP 2144.05 II.

With respect to claim 13, Akhtar discloses that the pulp solution is screened through 0.203 mm wide slots, which contains one specific point (0.203 mm is between No. 70 and 80 mesh) within the claimed range of 18 to 300 meshes.

With respect to claim 14, Akhtar discloses a biopulping method, and is applied as in the rejection of claim 1, above.

Sweeney discloses using a non-woody fiber plant (col. 1, lines 19-38).

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With respect to claims 15, 16, and 19, Akhtar is applied as in the rejections to claims 3, 6, and 13, above.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Akhtar, Sweeney, Schulein, and Jeffreys, as applied to claim 1 above, and further in view of Blanchette et al (U.S. Patent 5,427,945).

Akhtar, Sweeney, Schulein, and Jeffreys do not disclose expressly that the plant is added into the culture solution by a ratio of 4 to 15% (w/v).

Blanchette discloses that fiber plant is added into said culture solution by a ratio (e.g. consistency) of at least 7%, more preferably at least 9%, and desirably at least 12% (col. 5, lines 22-46), which contains three specific points within the claimed range of 4 to 15%.

Akhtar and Blanchette et al are analogous art because they are both from a similar field of endeavor, that of treating lignocellulosic material with enzymes to produce a paper product.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the consistency of Blanchette et al in the biopulping process of Akhtar, Sweeney, Schulein, and Jeffreys.

The motivation would have been that it has been independently found particularly effective to employ microorganisms in systems in which the pulp consistency is in the medium to high range (col. 5, lines 30-46).

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1 and 14 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 2 of copending Application No. 10/785,884. Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 2 of '884 fully encompasses instant claims 1 and 14.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Conclusion***


The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. 5,344,647 and U.S. 6,896,883 show *B. subtilis* isolated from faba bean plants and wheat plants, i.e., non-woody fiber plants. U.S. 5,589,381 shows *B. lichenformis* isolated from perennial ryegrass, i.e., a non-woody fiber plant. U.S. 2005/0266521 shows *B. subtilis* isolated from compost. Steam tables at [http://www.spiraxsarco.com/esc/SS\\_Properties.aspx?lang\\_id=ENG&country\\_id>HQ](http://www.spiraxsarco.com/esc/SS_Properties.aspx?lang_id=ENG&country_id>HQ) show that steam at a pressure of 138 kPa gauge has a saturation temperature of 126°C. U.S. 4,643,899 shows a gram-positive bacterium used to degrade peanut hull lignin. U.S. 4,687,745 shows the use of ligninolytic enzymes to treat mechanical pulps. U.S. 5,677,161 shows application of a *Bacillus stearothermophilus* preparation for delignifying wood pulp in the production of a paper, board, or fluff product.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anna Kinney whose telephone number is (571) 272-8388. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ALK

  
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